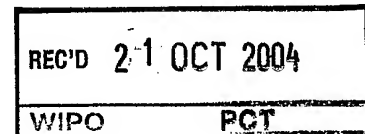SG04 /00305

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Date of Filing   :   01 MAR 2004

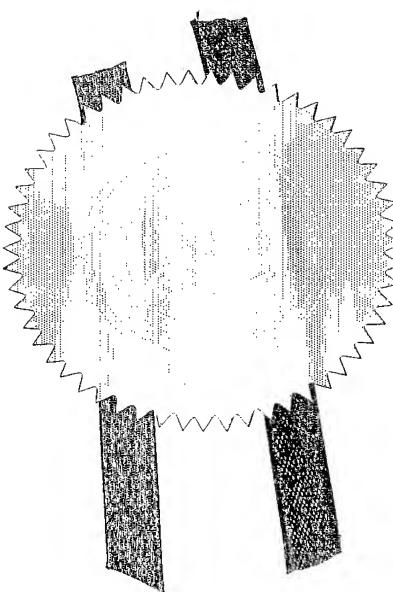Application Number   :   PCT/SG2004/000044

REC'D   2 1 OCT 2004

WIPO   PCT

Applicant(s) /   :   LIN, Feng;   SU, Ling
Proprietor(s) of Patent

Title of Invention   :   NETWORK PRINTING SYSTEM

Chig Kam Tack (Mr)
Senior Assistant Registrar
for REGISTRAR OF PATENTS
SINGAPORE

18 Oct 2004

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PCT REQUEST

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Original (for **SUBMISSION**)

0	For receiving Office use only	
0-1	International Application No.	PCT/SG 2 0 0 4 / 0 0 0 0 4 4
0-2	International Filing Date	0 1 MAR 2004 (01-03-2004)
0-3	Name of receiving Office and "PCT International Application"	REGISTRY OF PATENTS (SINGAPORE) PCT INTERNATIONAL APPLICATION

0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared Using	PCT-SAFE [EASY mode] Version 3.50 (Build 0002.158)
0-5	Petition	
	The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	Intellectual Property Office of Singapore (RO/SG)
0-7	Applicant's or agent's file reference	1
I	Title of Invention	NETWORK PRINTING SYSTEM
II	Applicant	
II-1	This person is:	applicant and inventor
II-2	Applicant for	all designated States
II-4	Name (LAST, First)	LIN, Feng
II-5	Address:	BLK 110, #12-120, Woodlands Street 13 730110 Singapore Singapore
II-6	State of nationality	CN
II-7	State of residence	SG
II-8	Telephone No.	65 96749524
II-10	e-mail	linlue@yahoo.com
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	all designated States
III-1-4	Name (LAST, First)	SU, Ling
III-1-5	Address:	BLK 110, #12-120, Woodlands Street 13 730110 Singapore Singapore
III-1-6	State of nationality	CN
III-1-7	State of residence	SG

PCT REQUEST

1

IV-1	Agent or common representative; or address for correspondence	address for correspondence
	No agent or common representative is/ has been appointed; the following special address should be used as:	
IV-1-1	Name (LAST, First)	LIN, Feng
IV-1-2	Address:	BLK 110, #12-120, Woodlands Street 13 730110 Singapore Singapore
IV-1-3	Telephone No.	65 96749524
IV-1-5	e-mail	linlue@yahoo.com
V	**DESIGNATIONS**	
V-1	The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.	
VI-1	Priority Claim	NONE
VII-1	International Searching Authority Chosen	Austrian Patent Office (ISA/AT)

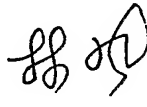| VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	–	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	–	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	–	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	1	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	–	

PCT REQUEST

| VIII-4-1 | Declaration: Inventorship (only for the purposes of the designation of the United States of America) Declaration of Inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America: | I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought. This declaration is directed to the international application of which it forms a part (if filing declaration with application). I hereby declare that my residence, mailing address, and citizenship are as stated next to my name. I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications", by application number, country or Member of the World Trade Organization, day, month, and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed. |
| VIII-4-1-1 | Prior applications: | |

1

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

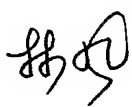| VIII-4-1-1-1	Name (LAST, First)	LIN, Feng
VIII-4-1-1-2	Residence: (city and either US State, if applicable, or country)	Singapore, Singapore
VIII-4-1-1-3	Mailing address:	BLK 110, #12-120, Woodlands Street 13 730110 Singapore Singapore
VIII-4-1-1-4	Citizenship:	CN
VIII-4-1-1-5	Inventor's Signature: (if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)	
VIII-4-1-1-6	Date: (of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)	Feb. 29, 2004

PCT REQUEST

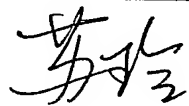| VIII-4-1-2-1	Name (LAST, First)	SU, Ling
VIII-4-1-2-2	Residence: (city and either US State, if applicable, or country)	Singapore, Singapore
VIII-4-1-2-3	Mailing address:	BLK 110, #12-120, Woodlands Street 13 730110 Singapore Singapore
VIII-4-1-2-4	Citizenship:	CN
VIII-4-1-2-5	Inventor's Signature: (if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)	
VIII-4-1-2-6	Date (of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)	Feb 29, 2004

PCT REQUEST

Original (for **SUBMISSION**)

IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	7	✓
IX-2	Description	8	–
IX-3	Claims	5	–
IX-4	Abstract	1	✓
IX-5	Drawings	3	–
IX-7	TOTAL	24	
	Accompanying Items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	–
IX-17	PCT-SAFE physical media	–	✓
IX-19	Figure of the drawings which should accompany the abstract	3	
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative		
X-1-1	Name (LAST, First)	LIN, Feng	
X-1-2	Name of signatory		
X-1-3	Capacity		
X-2	Signature of applicant, agent or common representative		
X-2-1	Name (LAST, First)	SU, Ling	
X-2-2	Name of signatory		
X-2-3	Capacity		

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	01 MAR 2004 (01-03-2004)
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/AT
10-6	Transmittal of search copy delayed until search fee is paid	

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11-1	Date of receipt of the record copy by the International Bureau	

NETWORK PRINTING SYSTEM

Background of the Invention

1. Field of the Invention

5   This invention relates to a network printing system for printing electronic documents (forms) via a local area network (LAN).

2. Description of Related Art

Big or small, every business relies on pre-printed forms and stationery. From invoices to form letters, these forms can often form the lifeblood of a company's

10 internal and external communications. However they also tend to form the bulk of a company's garbage. Misused, mis-printed, damaged and outdated forms all end up in the trashcan, wasting money and creating unnecessary refuse. Printing costs can also be significant, and even storage can place a drain on company resources.

Electronic forms provide a cost-effective solution by eliminating the

15 unnecessary ordering, shipping, spending and storing of professionally printed forms. With electronic forms, forms are printed as needed.

One existing solution of the electronic form is on the HP Flash DIMM (Dual Inline Memory Module) technology, you can print all of your invoices, forms and letterhead accurately and on-demand, using HP LaserJet printers. Flash DIMMs

20 provide non-volatile, rewritable memory for these printers, and the forms are stored in the Flash DIMM modules. These forms are constantly and immediately available to the printer, eliminating form downloading times and reducing overall printing times. Additional forms can also be saved to the printer's hard drive. This Flash DIMM can act as a stationery cupboard, replacing the need to stock boxes of forms. Better still,

25 when a form becomes obsolete, you can simply reprogram the module - no more throwing out boxes of outdated forms.

However, the Flash DIMM solution has disadvantages: (1) many regular printers have no sockets for Flash DIMM modules; (2) if a management wants to print electronic forms in a company, he has to install Flash DIMMs in every printer;

30 (3) if a form is updated, it has to be reprogrammed to every printer; and (4) forms are stored in the Flash DIMM of printer, so it is not possible to fill in forms with the data created in the computer on the fly.

Electronic forms may be distributed in the email or put in the website for staffs

to print. However, some of them cannot print these forms, because they have no computers or suitable printing software/drivers, or their computers do not connect to appropriate printers such as color laser printers.

Summary of the Invention

5   An object of the present invention is to provide an easy and simple way to print electronic documents (forms) at the appropriate printers.

Another object is to use one central server to work for many printers, and to manage and update documents in the central server only.

Another object is to use a low cost and simple keypad to select and print

10   documents.

Another object is to provide a method of printing documents for the staff, which has no computers, no print software or no connections to the printers.

A network printer system includes a LAN, a server, networked printers and networked keypads. The server connects by use of the LAN to the printers and

15   keypads. A method for printing a document in the network printing system includes: (1) a user presses number keys to enter document number on a keypad; (2) the keypad sends to the server a print-request that includes the document number and the keypad IP address; (3) the server receives the print-request and identifies the document and the keypad; (4) in order to print the document at an appropriate printer

20   such as near to the user and suitable to print the document, the server, in accordance with an assignment that assigns printers to keypads, determines an appropriate printer among the printers that are assigned to the keypad; (5) the server retrieves the document; and (6) the server prints the document to the appropriate printer via the LAN.

25   ## Brief Description of the Drawings

FIG.1 is a block diagram of a networked keypad according to the present invention.

FIG.2 is a data packet of the print-request issued by a networked keypad according to the present invention.

30   FIG.3 illustrates a network printing system according to the present invention.

FIG.4 is a block diagram of a networked printer with the function of networked keypad according to the present invention.

Detailed Description of the Preferred Embodiments

Preferred embodiments of the present invention will now be described in details with reference to the accompanying drawings.

FIG.1 is a block diagram of a networked keypad according to the present
5 invention.

FIG.2 is a data packet of the print-request issued by a networked keypad according to the present invention.

A networked keypad of the present invention consists of keypad 1, LCD 2, 8-bit microprocessor 3 and network interface 4. Keypad 1 has number keys 0-9 and
10 PRINT key. A user can press number keys to enter (select) a document number, such as press 1001 to select document "1001"; after that, press PRINT key to issue a print-request 6 to a server. LCD 2 shows the document number and other status. Network interface 4 connects the networked keypad to LAN 5. And 8-bit microprocessor 3 controls keypad 1, LCD 2 and network interface 4, and processes
15 user's requests.

Microprocessor 3 runs the TCP/IP protocol, and a server IP address is set up in its memory, so the networked keypad can communicate to the server, and send the data packet of the print-request 6. FIG.2 shows the fields of a print-request 6, including the server IP address, the networked keypad IP address, the identification
20 of the print-request, and the document number.

An 8-bit microprocessor module RCM2200 (a product of Rabbit Semiconductor), which includes microprocessor, memory, network interface and input/output ports for connecting to additional LCD and keypad, can be used to build a networked keypad easily and at low cost.

25 By using the networked keypad, the steps for a user to print a document such as document "1001" are: (1) the user presses keys 1001 and PRINT key on keypad 1; (2) microprocessor 3 gets the 1001 as document number, and issues a packet of the print-request 6 to a server via LAN 5; (3) the server prints the document "1001" at the appropriate printer, which is near to the user and suitable for printing the
30 document "1001".

One advantage of the invention is the simple and easy operation: by pressing a few keys (such as number keys 1001 and PRINT key) only, a user can select and print a document ("1001"). And another advantage is that the networked keypad is low cost.

FIG.3 illustrates a network printing system according to the present invention.

The network printing system comprises a LAN 5, a server 7, four networked printers and two networked keypads. The networked keypad has been described in FIG.1 and FIG.2. The four printers and two keypads are installed in two printer
5   rooms. Printer room 10 has a laser printer 12, a color laser printer 13 and a networked keypad 11; and printer room 20 has a laser printer 22, a color laser printer 23 and a networked keypad 21. Server 7 connects by use of LAN 5 to the four printers and two keypads. The TCP/IP network protocol and the Ethernet run on LAN 5, to send and receive data packets between server 7 and networked printers and
10   keypads.

Server 7 is a computer (or multiple computers) running on a Microsoft Windows 2000 operating system. Printer 12 and 22 are HP LaserJet 1300n networked printers; and printer 13 and 23 are HP Color LaserJet 3500n networked printers. In order to print documents at printers, server 7 installs network printer
15   software drivers.

Server 7 stores documents on the disk. Table 8 has a column named "Document" that lists three examples: "claim form.prn", "leave form.doc" and "color brochure.prn". However, server 7 may produce or import documents, e.g. by accessing a database. The documents are saved as either printer-specific data or
20   program-specific data. For example, the document "claim form.prn" is saved as printer-specific (HP PCL) data. To print such document, server 7 sends directly the document via LAN 5 to the printer such as HP LaserJet 1300n/3500n. Another document "leave form.doc" is saved as program-specific (Microsoft Word) data. To print the document, server 7, by invoking the COM interface of Microsoft Word,
25   launches the program, loads the document and prints it at the printer through a network printer software driver.

Server 7 includes table 8 that uses numbers to represent documents. For example, in the row 1 number "1001" represents the document "claim form.prn"; in the row 2 number "1002" represents the document "leave form.doc" and so on. The
30   documents "claim form.prn", "leave from.doc' and "color brochure.prn" are simply referred to as documents "1001", "1002" and "1003" elsewhere in the description. By representing documents as numbers, a user can easily use a simple keypad to indicate the document that he wants to print. For example, a user can press number "1001" on a keypad if he wants to print the document "claim form.prn".

In order for server 7 to determinate an appropriate destination printer (such as near to a user or suitable to print a document), table 8 (also called as assignment table) includes the assignment columns named "Keypad 11" and "Keypad 21", which assign printers to keypads. As printer 12, 13 and keypad 11 are all at the printer

5   room 10, in the column "Keypad 11" printers 12 and 13 are assigned to keypad 11; and as printer 22, 23 and keypad 21 are all at the printer room 20, in the column "Keypad 21" printers 22 and 23 are assigned to keypad 21. The meanings of the assigning are: (1) if server 7 receives a print-request 6 from keypad 11, in accordance with the column "Keypad 11", it selects one of the assigned printers 12

10   and 13, which are near to the user (keypad 11), as the destination printer; and (2) if server 7 receives a print-request 6 from keypad 21, in accordance with the column "Keypad 21", it selects one of the assigned printers 22 and 23, which are near to the user (keypad 21), as the destination printer.

Now refer to assignment table 8 and use examples to describe how server 7

15   selects an appropriate destination printer when it receives a print-request from a keypad.

Example (1): server 7 receives a print-request for document "1001" from keypad 11. The number 1001 is in the row 1, and printer 12 is at the intersection of the row 1 and the column "Keypad 11", so server 7 selects the printer 12 as the

20   destination printer to print the document "1001".

Example (2): server 7 receives a print-request for document "1003" (i.e. color brochure) from keypad 11, server 7 selects the color printer 13, which is at the intersection of the row 3 and the column "Keypad 11", as the destination printer.

Example (3): server 7 receives a print-request for document "1002" from

25   keypad 11. Printers 12 and 13 are at the intersection of the row 2 and the column "Keypad 11", so server 7 tries to use the printer 12 first. However, if printer 12 is busy or out of order, server 7 prints the document "1002" at the printer 13.

Example (4): server 7 receives a print-request for document "1001" from keypad 21, so server 7 selects the printer 22, which is at the intersection of the row 1

30   and the column "Keypad 21".

Assigning a plurality of printers to a keypad can make sure to print the document in the appropriate printer, for example, print a simple form at a black-white printer, but print a brochure at a color printer; print a multi-page data sheet at a two-sided printing printer; and print at another appropriate printer when the first

5

destination printer is busy. One advantage of the invention is to print documents at suitable printers.

Because server 7 determines a destination printer by relying on an assignment of printers to keypads, when server 7 receives a print-request, it needs to know which keypad issues the request. So the packet of the print-request 6 arrives at server 7 with the identification information of the networked keypad. The keypad IP address is convenient and preferred to be the identification information of the networked keypad. However, unique data may be assigned to the keypad as its identification information.

In the preferred embodiment, server 7 includes assignment table 8, and when server 7 operates according to the invention, it loads table 8 to its memory. However, the assignment in table 8 may be stored to each keypad either by downloading from server 7 or by an IT administrator.

A first example: because in the column "Keypad 11" printers 12 and 13 are assigned to keypad 11, server 7 downloads the identification information of printers 12 and 13 to keypad 11. Thereafter, if keypad 11 issues a print-request, the print-request includes the identification information of printers 12 and 13. When server 7 receives the print-request, according to table 8 and the document number in the print-request, server 7 determines an appropriate destination printer among printers 12 and 13. For example, for document "1001" server 7 selects printer 12, but for document 1003 it selects printer 13.

A second example: server 7 downloads the contents of the columns "Number" and "Keypad 11" to keypad 11. Thereafter, if a user enters a document number on keypad 11, keypad 11 selects an appropriate printer according to the document number and the downloaded contents, for document 1001 it selects printer 12, but for document 1003 it selects printer 13. Then keypad 11 issues a print-request that includes the identification information of the appropriate printer.

Summarily, the information in the print-request of a keypad assists server 7 to determine a destination printer, and the destination printer is among the printers that are assigned to the keypad.

FIG.4 is a block diagram of a network printer with the function of networked keypad according to the present invention.

The networked keypad of FIG.1 has very limited hardware components and its size is quite small, and a networked printer has microprocessor and network interface, so the networked keypad tends to be mount on the printer and to become as a part of the printer. Such new printer 30 has a keypad 31, and uses directly the
5   microprocessor and network interface of printer 30 to issue the print-request 6, to cause server 7 to print the document at printer 30 or at other printer according to assignment table 8. After understand FIG.1-4 and the invention, skillful persons in the printer art can develop the new printers that include the networked keypad of the invention.

10   Now refer to FIG.1-4, in the network printing system of the invention, the overall procedures for printing document are described:

(1) in keypads 11 and 21, store their local IP addresses and server 7 IP address;

(2) on the disk of server 7, store documents "claim form.prn", "leave form.doc"
15   and "color brochure.prn", and use numbers "1001", "1002", "1003" to represent these documents;

(3.1) in server 7, establish the assignment table 8 that assigns printers to keypads; or

(3.2) server 7 or an IT administrator, according to the assignment table 8,
20   stores identification information of printers 12 and 13 to keypad 11; and stores identification information of printers 22 and 23 to keypad 21;

now the network printing system is ready to print documents for users,

(4) a user presses keys such as 1001 and PRINT key on keypad 11;

(5) keypad 11 sends a packet of print-request 6 to server 7, the print-request
25   6 includes number "1001", IP address of server 7, and IP address of keypad 11 (for above (3.1)) or identification information of the assigned printers 12 and 13 (for above (3.2));

(6) server 7 receives the print-request 6 and identifies the number "1001", then server 7, according to the row 1, retrieves the document "1001", i.e. the
30   document "claim form.prn";

(7.1) for above (3.1), server 7 checks IP address in the print-request 6, and knows that keypad 11 issues the print-request 6. Then server 7 selects printer 12,

7

which is at the intersection of the row 1 (document "1001") and the column "Keypad 11", as the destination printer; or

(7.2) for above (3.2), the row 1 of table 8 shows that printer 12 and 22 are suitable for printing document "1001", and the print-request specifies the assigned printers 12 and 13, so server 7 selects the printer 12, which is suitable for printing document "1001" and also among the assigned printers;

(8) server 7 checks file extension (i.e. ".prn", and ".doc") to determine the date type of documents. If a document is in printer-specific data such as HP PCL, server 7 sends the document to printer 12; however, if a document is in program (such as Microsoft Word) specific data, server 7 loads the document to the program by using the COM technology; and

(9) finally, server 7 prints the document "claim form.prn" at the destination printer 12 via LAN 5.

Claims

1. A network printing system comprising:

a LAN;

5   a plurality of networked printers;

a plurality of networked keypads; and

a server connecting by use of said LAN to said plurality of networked printers and said plurality of networked keypads;

each of said plurality of networked keypads comprising:

10   a keypad for the user to indicate the selected document; and

means for issuing, to said server via said LAN, the print-request that includes the identification information of said networked keypad and said selected document;

said server comprising:

an assignment that assigns said plurality of networked printers to said plurality

15   of networked keypads;

means for receiving, via said LAN, the print-request issued by any of said plurality of networked keypads;

means for decoding said print-request to identify the selected document and the networked keypad that issues said print-request;

20   means for determining, in accordance with said assignment, an appropriate destination printer among one or more printers assigned to said networked keypad;

means for retrieving said selected document; and

means for printing said selected document to said destination printer via said LAN.

25   2. A method for printing documents in a network printing system that includes a LAN, a plurality of networked printers, a plurality of networked keypads, and a server connecting by use of the LAN to the plurality of networked printers and the plurality of networked keypads, said method comprising:

including, at said server, an assignment that assigns said plurality of

30   networked printers to said plurality of networked keypads;

indicating, at any of said plurality of networked keypads, a selected document;

issuing, at said networked keypad to said server via said LAN, a print-request that includes identification information of said selected document and said networked keypad;

receiving, at said server, said print-request;

5 decoding said print-request to identify said selected document and said networked keypad that issues said print-request;

determining, in accordance with said assignment, an appropriate destination printer among one or more networked printers assigned to said networked keypad;

retrieving said selected document; and

10 printing said selected document to said destination printer via said LAN.

3. A server connecting by use of a LAN to a plurality of networked printers and a plurality of networked keypads, said server comprising:

an assignment that assigns said plurality of networked printers to said plurality of networked keypads;

15 means for receiving, via said LAN, the print-request that includes identification information of the selected document and the networked keypad;

means for decoding said print-request to identify said selected document and said networked keypad that issues said print-request;

means for determining, in accordance with said assignment, an appropriate
20 destination networked printer among one or more networked printers that are assigned to said networked keypad;

means for retrieving selected document; and

means for printing said selected document to said destination networked printers via said LAN.

25 4. A computer program, stored in a computer readable medium, wherein the computer program is capable of causing a server, which connects by use of a LAN to a plurality of networked printers and a plurality of networked keypads, to perform:

loading an assignment that assigns said plurality of networked printers to said plurality of networked keypad;

30 receiving, via said LAN, the print-request that includes identification information of the selected document and the networked keypad;

decoding said print-request to identify said selected document and said networked keypad that issues said print-request;

determining, in accordance with said loaded assignment, an appropriate destination networked printer among one or more networked printers that are assigned to said networked keypad;

retrieving said selected document; and

5   printing said selected document to said destination networked printers via said LAN.

5. A networked keypad using in the network printing system of claim 1 comprising:

a keypad for user to indicate the selected document; and

10   means for issuing the print-request that includes identification information of said selected document and said networked keypad to the server of said network printing system, and said print-request causes said server, in accordance with the assignment of networked printers to networked keypads, to print said selected document to an appropriate destination printer among one or more networked

15   printers assigned to said networked keypad.

6. A printer using in the network printing system of claim 1, comprising a networked keypad of claim 5.

7. The network printing system of claim 1, the identification information of the networked keypad is the IP address of said networked keypad.

20   8. The method of claim 2, the identification information of the networked keypad is the IP address of said networked keypad.

9. The server of claim 3, the identification information of the networked keypad is the IP address of said networked keypad.

10. The computer program of claim 4, the identification information of the

25   networked keypad is the IP address of said networked keypad.

11. The networked keypad of claim 5, the identification information of the networked keypad is the IP address of said networked keypad.

12. The network printing system of claim 1, wherein said determining destination printer further includes determining according to the selected document.

30   13. The method of claim 2, wherein said determining destination printer further includes determining according to the selected document.

14. The server of claim 3, wherein said determining destination printer further includes determining according to the selected document.

15. The computer program of claim 4, wherein said determining destination printer further includes determining according to the selected document.

5   16. A network printing system comprising:

· a LAN;

a plurality of networked printers;

a plurality of networked keypads; and

a server connecting by use of said LAN to said plurality of networked printers
10 and said plurality of networked keypads;

an assignment that assigns said plurality of networked printers to said plurality of networked keypads;

each of said plurality of networked keypad comprising:

a keypad for user to indicate selected document; and

15   means for issuing, to said server via said LAN, the print-request that includes identification information of the selected document and the assisting information that assists said server in determining a destination printer;

said server comprising:

means for receiving, via said LAN, the print-request issued by any of said
20 plurality of networked keypads;

means for decoding said print-request to identify said selected document and said assisting information;

means for determining a destination printer according to said assisting information, and said destination printer is among one of more printers that are
25 assigned, in accordance with said assignment, to said keypad that issues said print-request;

means for retrieving said selected document; and

means for printing said selected document to said destination printer via said LAN.

30   17. A server connecting by use of a LAN to a plurality of networked printers and a plurality of networked keypads, said server comprising:

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an assignment that assigns said plurality of networked printers to said plurality of networked keypads;

means for receiving, via the LAN, the print-request that includes identification information of the selected document and the assisting information that assists said
5   server in determining a destination printer;

means for decoding said print-request to identify said selected document and said assisting information;

means for determining a destination printer according to said assisting information, and said destination printer is among said one of more printers that are
10   assigned, in accordance with said assignment, to said keypad that issues said print-request;

means for retrieving said selected document; and

means for printing said selected document to said destination networked printer via the LAN.

15   18. A networked keypad using in the network printing system of claim 16 comprising:

a keypad for user to indicate the selected document; and

means for issuing, to the server of said network printing system via the LAN, the print-request that includes identification information of the selected document
20   and the assisting information that assists said server in determining a destination printer; and said print-request causes the server to determine a destination networked printer according to said assisting information, and said destination printer is among one of more networked printers that are assigned to said keypad according to an assignment of networked printers to networked keypads, and finally to print the
25   selected document at said destination networked printer.

19. A printer using in the network printing system of claim 16 comprising a networked keypad of claim 18.

Abstract

By using networked keypads, this invention provides a simple and easy way to print electronic forms (documents). A network printing system includes a LAN, a server, networked printers and networked keypads. A method for printing a document includes: (1) a user presses number keys to enter document number on a keypad; (2) the keypad sends to the server a print-request that includes the document number and the keypad IP address; (3) the server receives the print-request and identifies the document and the keypad; (4) in order to print the document at an appropriate printer such as near to the user and suitable to print the document, the server, in accordance with an assignment that assigns printers to keypads, determines an appropriate printer among the printers that are assigned to the keypad; (5) the server retrieves the document; and (6) the server prints the document to the appropriate printer via the LAN.
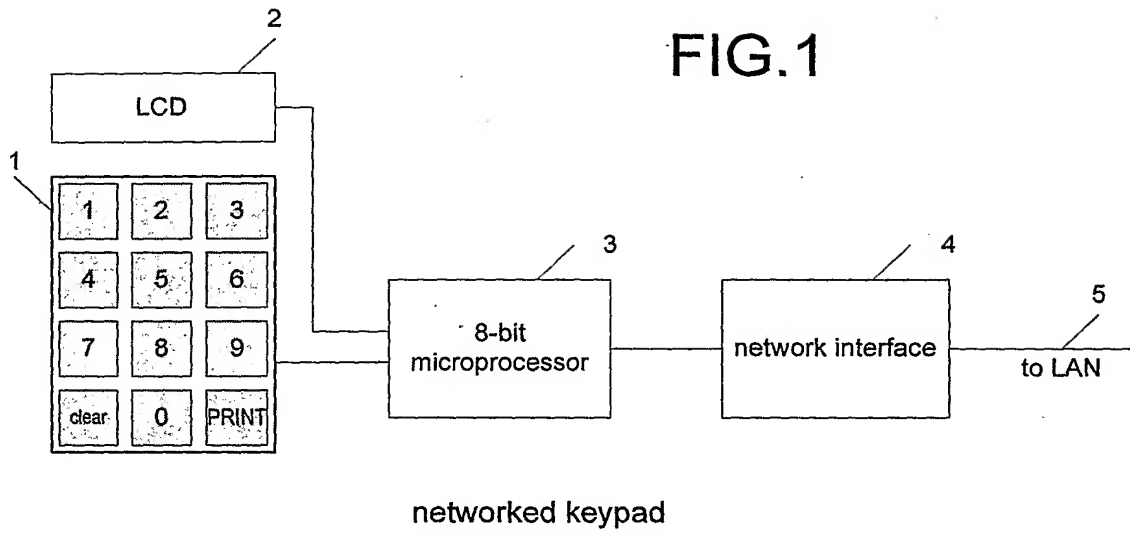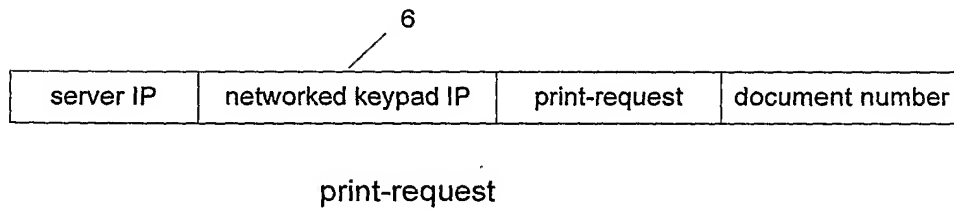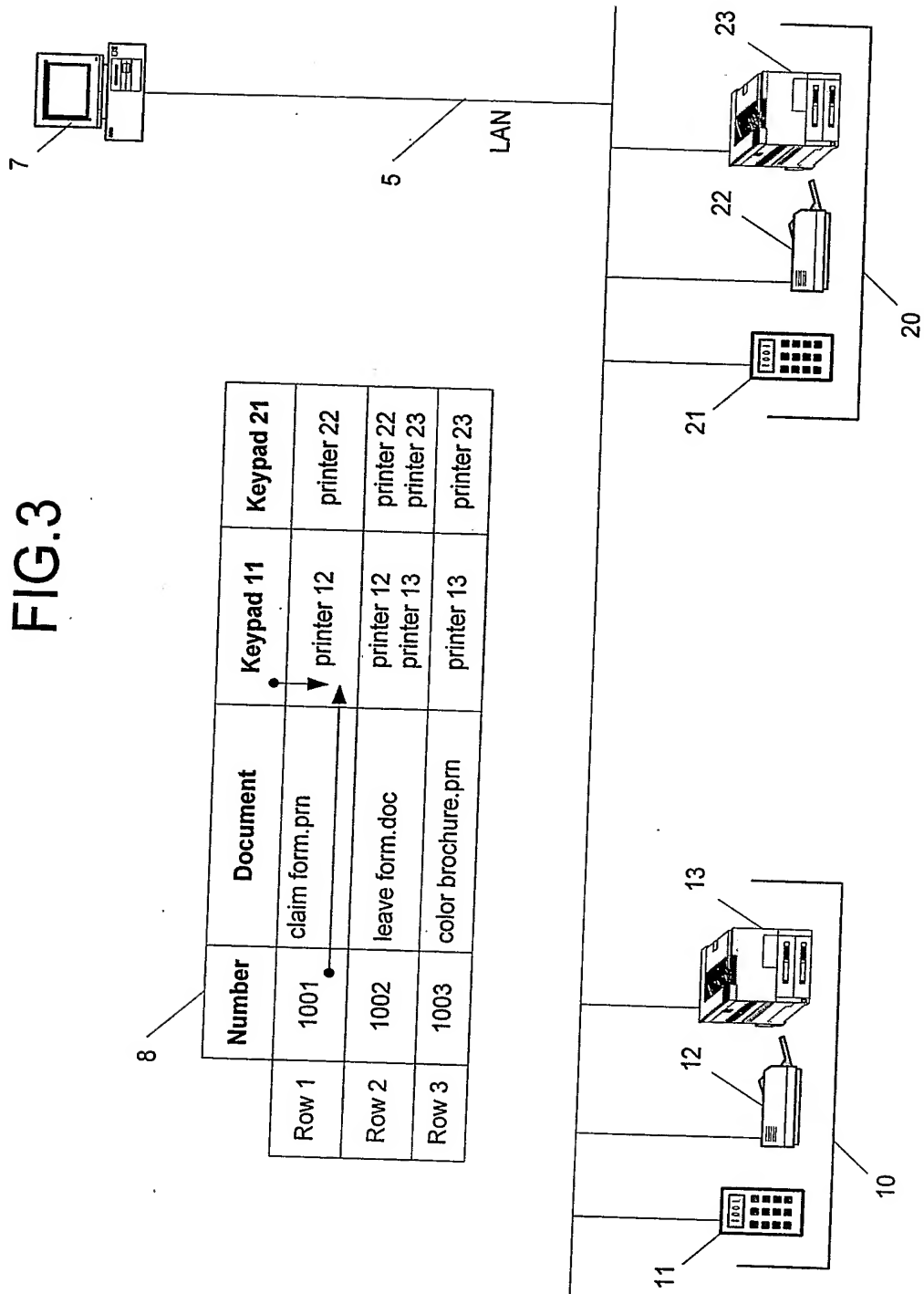
FIG.1

networked keypad

FIG.2

server IP	networked keypad IP	print-request	document number

print-request

FIG.3

	Number	Document	Keypad 11	Keypad 21
Row 1	1001	claim form.prn	printer 12	printer 22
Row 2	1002	leave form.doc	printer 12 printer 13	printer 22 printer 23
Row 3	1003	color brochure.prn	printer 13	printer 23

FIG.4

new printer